



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL WEATHER SERVICE ALASKA REGION
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Mendenhall River Flooding, August 5, 2023

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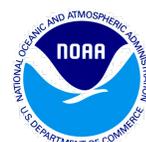
Overview

A glacier dam outburst flood occurred in the Mendenhall Valley about 10 miles to the northwest of downtown Juneau on Saturday, August 5th. The source of water was from a side basin, Suicide Basin, less than one mile from the terminus of the Mendenhall Glacier. Suicide Basin used to be filled with ice from Suicide Glacier but as the glacier has receded ice is not deposited into the basin. Now water from snowmelt, ice melt, and rainfall fills the basin. There are also floating icebergs present in the basin which have complicated the understanding of this dynamic basin along with other factors.

Suicide Basin fills up and drains annually with some years producing minor or moderate flooding impacts and with other years producing no impacts along Mendenhall Lake and River. The USGS stream gage was installed in 1965. There were no glacier outburst events recorded by the stream gage from 1965 through 2011. The first outburst event occurred in July 2011. The Mendenhall Lake/River system has had approximately 35 glacial dammed lake release events since that July 2011. Release volumes of these glacier-dammed lake outburst floods (GLOF) range from relatively small (less than 10,000 acre-feet) to the 3 previous large releases, by volume (2016, 2020, 2022), with the largest in June 2016 (30,132 acre-feet). GLOF release volumes are based on measured flow at the Mendenhall River USGS stream gage located in Mendenhall Lake.

This year, the basin, like in 2 other years (2019 and 2020), was full to the top of the Mendenhall Glacier (top of the ice dam) and started to flow down a slide drainage channel. After about 7 days Suicide Basin began to drain sub-glacially (the water pressure lifted up the Mendenhall Glacier to begin the draining process from underneath the glacier) in the evening of August 3rd. Mendenhall Lake started to rise from the additional water from the basin into the lake by Thursday evening and into the early morning of Friday, August 4th. The level of Mendenhall Lake was near normal levels of 5.5 feet before this rise started and by Saturday morning water levels were over moderate flood stage of 10 feet with areas beginning to see moderate flooding impacts. By midday on Saturday the water levels exceeded the previous record from 2016 of 11.99 feet and impacts were increasing along the Mendenhall River. The river continued to rise at a fast pace through the day into the evening hours and the river crested near 14.82 feet (preliminary crest from the USGS) by 12 AM AKDT on August 6th. The Mendenhall Lake and River were back below minor flood stage of 9.0 feet by 9:45 AM AKDT on Sunday, August 6th.

This record event produced flooding and erosion along Mendenhall Lake and River that has not been seen in the past. Multiple areas experienced major flooding with a few homes seeing over 6 feet of water in them along with massive amounts of river bank erosion of 20 to 150 feet in some places. From this erosion, multiple



homes and an apartment complex were compromised with one entirely falling into the river with portions of others being lost.

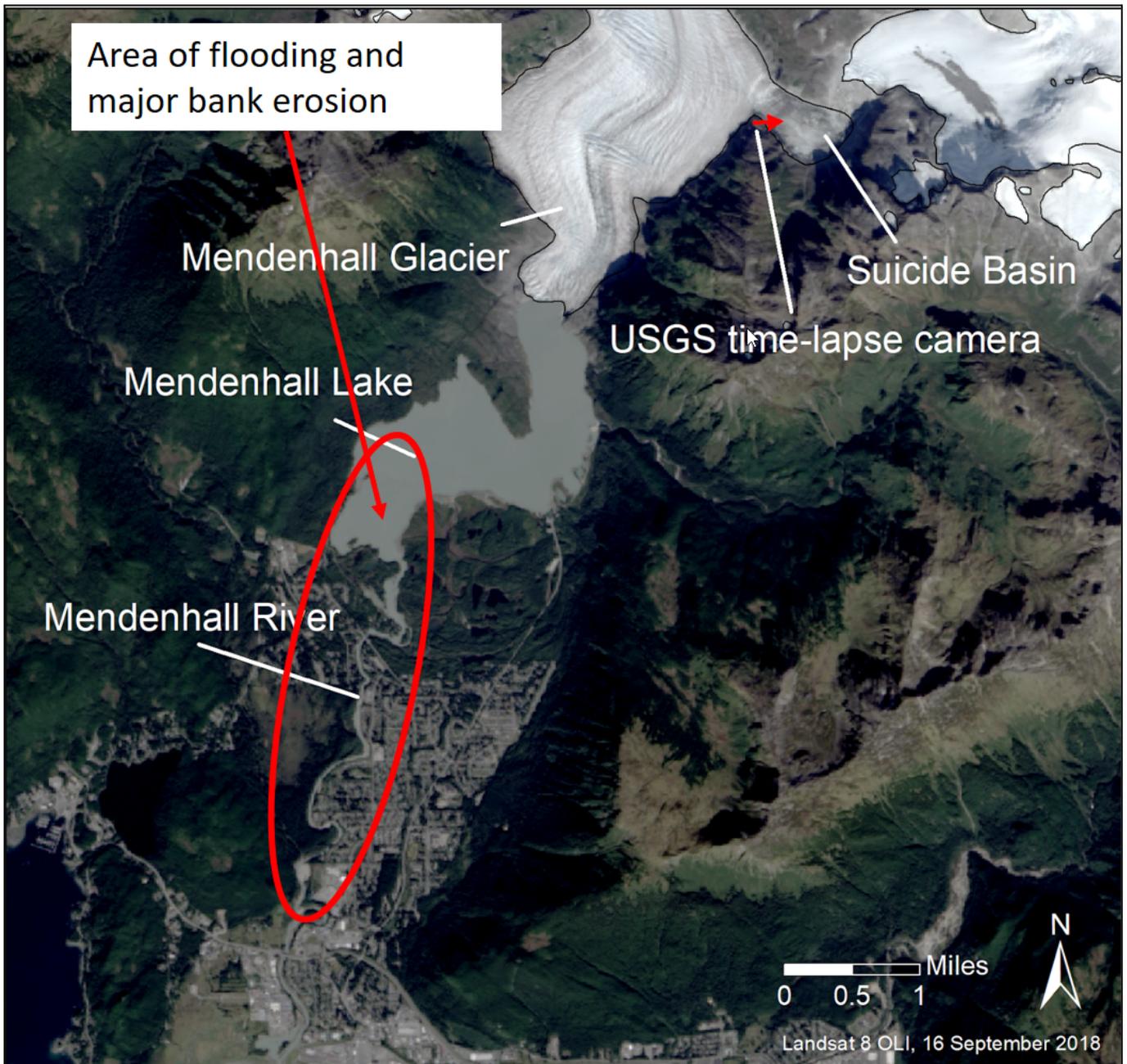


Image 1: Map of Mendenhall Valley with downtown Juneau to the SE of this image

Storm Report Summary

The map below contains all of the Local Storm Reports gathered by NWS Offices during this event. For more detailed information, you can view them individually [here](#).

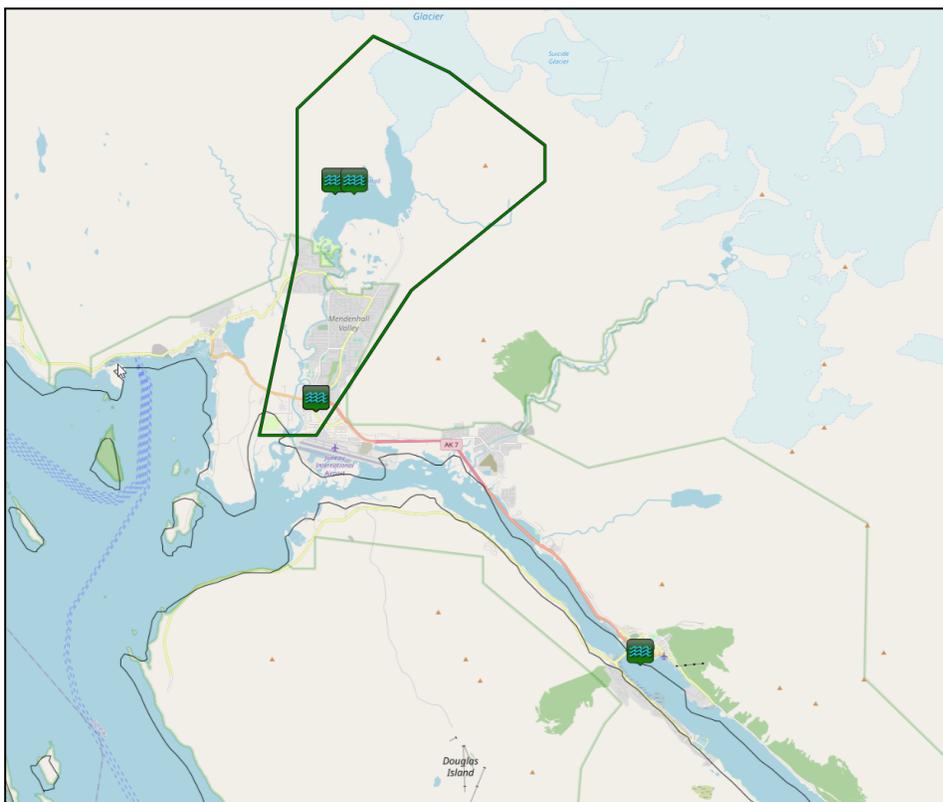


Image 2: Storm Reports from August 5-6, 2023 ( = Flooding)

River Flooding

This flooding event was historic in an area that had not seen this type of flooding or rate of riverbank erosion in the past. There were flooding impacts in the Mendenhall Valley, where a majority of Juneau's population resides, where historically it does not flood. While other locations that have experienced flooding impacts from these types of events in the past, they saw major damage this time around. This event was 3 feet higher than the previous record from 2016 and the Mendenhall Lake and River rose approximately 9.42 feet.

Flooding

The flood on the Mendenhall River from August 5-6, 2023 was caused by a release of a glacial dammed lake adjacent to the Mendenhall Glacier. The preliminary peak stage was 14.82 feet, gage datum, measured at the [USGS](#) stream gage. The preliminary estimate of the release volume for this event is approximately 43,000 acre-feet. The previous record peak stage was 11.99 feet, gage datum, on July 1, 2016. The record flooding from this event was a result of the amount of volume that came out of the basin and the rate of rise. Throughout the event, the rate of rise was unprecedented in which from midday on Saturday to a few hours before the peak, the rate of rise on the river was around 0.4 feet per hour.

The total water level rise at the USGS Mendenhall Lake gage from the onset of the glacier dam lake release to the peak was around 9.4 feet and occurred in a 48-hour period. The rate of rise of Mendenhall Lake and the Mendenhall River which flows 6 miles from Mendenhall Lake into Fritz Cove was unprecedented relative to previous events. The preliminary peak discharge from this event at the Mendenhall Lake gage was 26,000 ft³/s versus the 16,300 ft³/s previous record (July 1st, 2016). The outburst event increased discharge into Mendenhall Lake and River by approximately 22,770 ft³/s. The extreme peak discharge coupled with the relatively steep gradient of the Mendenhall River resulted in river velocities and subsequent erosion rates that would be unequalled to any previous event. The extreme erosion rates added to the impacts of the overbank flooding during this event.

Timeline of Events

- Initial signs of the release were noted on the night of August 3rd when the Mendenhall Lake gage showed lake levels rising beyond diurnal expectation.
- The Friday, August 4th morning image from the Suicide Basin Webcam confirmed the start of the release showing a large drop in water levels in Suicide Basin.
- Initial flood warning was issued at 10:57 AM Friday, August 4th.
- Mendenhall Lake reached minor flood stage (9.0 feet) at 2:30 AM Saturday, August 5th.
- Mendenhall Lake reached moderate flood stage (10.0 feet) at 6:15 AM Saturday, August 5th.
- Mendenhall Lake passed the previous record stage of 11.99 feet at 12:30 PM Saturday, August 5th.
- At 2 PM Saturday, August 5th reports of significant flooding along View Drive with the road cut off with feet of water. People were getting across with boats to help neighbors get things to higher ground along with one house at the end of the road trying to dewater the house with pumps. There were also smells of a fuel spill.
- At 3:30 PM Saturday, August 5th reports of significant flooding along Skaters Cabin Road with the Mendenhall Lake Campground entirely underwater.
- At 5:30 PM Saturday, August 5th a National Weather Service observer reported significant bank erosion downstream of the Back Loop Bridge.
- Mendenhall Lake reached major flood stage (14.0 feet) at 6:45 PM Saturday, August 5th.
- Around 6 PM Saturday, August 5th reports from around Meander Way of water getting to the back of homes and water started to come up from the storm drains.
- Reports around 7:30 PM Saturday, August 5th that police were closing passage of the Mendenhall Back Loop Bridge and a footbridge further downstream due to safety concerns from erosion.
- At 7:58 PM Saturday, August 5th reports of houses flooded and fuel leak on View Drive. Several houses are getting undercut and collapsing into the river at Riverside near Riverside Condos. At least one house started to collapse into the river.
- At 8 PM Saturday, August 5th reports of water going into homes and crawl spaces along and around Meander Way.
- At 9 PM Saturday, August 5th reports of roads flooding near and around Mendenhall River elementary school.
- At 10 PM Saturday, August 5th reports of 1 foot of water in homes along and around Meander Way and other locations in the Mendenhall Valley.

- Mendenhall Lake crested at 11:15 PM Saturday, August 5th at a new record high stage of 14.82 feet about 3 feet above the previous record high stage.
- Mendenhall Lake dropped below major flood stage at 1:30 AM Sunday, August 6th.
- Mendenhall Lake dropped below moderate flood stage at 8:00 AM Sunday, August 6th.
- Flood warning expired at 10 AM Sunday, August 6th.
- Mendenhall Lake dropped below minor flood stage at 10:15 AM Sunday, August 6th.
- Around 10:30 AM Sunday, August 6th the Mendenhall Back Loop Bridge and footbridge were reopened.

Photos



Image 3: Mendenhall River looking at Riverside Condos, a house that fell into the river, and a major damaged house from 4489 River Road



Image 4: 9 PM Aug 5 Meander Way in Juneau



Image 5: Homes along View Drive.



Image 6: Last home along View Drive with 7 feet of water in a home.